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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,197	08/02/2006	Seung Hyon Nam	293945US2PCT	6793
22850	7590	08/26/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER HAN, QI	
			ART UNIT 2626	PAPER NUMBER
			NOTIFICATION DATE 08/26/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/588,197	<b>Applicant(s)</b> NAM, SEUNG HYON	
	<b>Examiner</b> QI HAN	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-13 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/02/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **U.S.C. National Stage Application**

1. Acknowledgement is made of the indication that the present application is filed under 35 U.S.C. 371, of the indication that the required form PCT/DO/ED/903 is present, and of the use of transmittal form PCT/DO/EO/1390. Thus, the present application is being treated as a filing under 35 U.S.C. 371.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### **Response to Amendment**

3. This communication is responsive to the applicant's preliminary amendment filed on 08/02/2006. The applicant(s) cancelled claims 1-7, and added new claims 8-13 (see the preliminary amendment: pages 4-6).

4. It is noted that a prior art search has been conducted by the examiner (see detail in the cited references in the attached PTO-892 form).

### ***Allowable Subject Matter***

5. Claims 8-13 are allowed.

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The following is an examiner's statement of reasons for allowance:

Regarding independent **claims 8, 12 and 13**, the instant application is directed to a method, apparatus and computer readable storage medium for separating mixed (audio) signals into component signals. Each of the independent claims, combining some well known features in the art, identifies the uniquely distinct features of:

(d) computing aliasing-free normalized cross-power spectra of said component signals and said nonlinear-transformed signals in (c);

(e) computing natural gradient using said cross-power spectra;

(f) updating separating filter coefficients using said natural gradient;

(g) normalizing said separating filter coefficients;

(h) determining convergence conditions and iterating from (a) to (g) until convergence; and

(i) separating said mixed signals into component signals using said separating filter coefficients after convergence.

6. The prior art of record, Parra et al. (US 6,167,417), Papadias (US 6,654,719 B1), Visser et al. (US 2006/0053002 A1), Ramakrishnan et al. (US 2004/0117186 A1), and Erten et al. (US 6,625,587 B1) provided numerous teachings and techniques of separating mixed signals, including performing blind source separation (BSS) using convolutive signal decorrelation, computing cross-correlation with DFT values of the mixed signals, computing filter coefficients using a gradient descent process, and transforming the filter coefficients from frequency domain to time domain; updating filtering matrix after being initialized until it is converged; separating a

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mixed audio signals received from differently positioned microphones, using adapted filter coefficients and weight update dynamics to assist convergence, applying nonlinear bounded function to the mixed signals; separating acoustic signals generated by multiple acoustic sources, such as mixed speech spoken simultaneously by several speakers using HMM; and providing signal separation process defining a relationship between input/output signals by a state space representation. However, the combined features stated above, are not anticipated by, nor made obvious over the prior art of the record.

### ***Conclusion***

7. This application is in condition for allowance except for the following formal matters:

a. In the ***Drawings***:

Fig.2a, the text “FILTER UIUPDATE” in block 203 appears to be -- FILTER UPDATE--. Appropriate correction/replacement is required.

Fig.2c, the referenced labels are not readable because they are too small. Appropriate correction/replacement is required.

b. In the ***Specification***:

page 5, equation (7), the first item of right portion of the equation has a typographical error, comparing with the same equation (on page 36-15) of the certified copy of foreign priority application. Appropriate correction is required.

8. Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, (Comm’r Pat. 1935).

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A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

9. Please address mail to be delivered by the United States Postal Service (USPS) as follows:

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**or faxed to:** 571-273-8300, (for formal communications intended for entry)

**Or:** 571-273-8300, (for informal or draft communications, and please label "PROPOSED" or "DRAFT")

If no Mail Stop is indicated below, the line beginning Mail Stop should be omitted from the address.

Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QI HAN whose telephone number is (571)272-7604. The examiner can normally be reached on M-TH:9:00-17:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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QH/qh

August 20, 2009

/Qi Han/

Primary Examiner, Art Unit 2626